



NASA STTR 2011 Phase I Solicitation

T10.02 Energy Conservation and Sustainability

Lead Center: SSC

John C Stennis Space Center (SSC) is a large rocket propulsion test facility located in southern Mississippi close to the Louisiana state line. Energy consumption is very large to sustain the static engine testing and supporting facilities. In an effort to conserve on energy and enhance the sustainability of these and other SSC facilities, interest exists in pursuing innovative approaches to energy savings, water efficiency, CO₂ emission reductions, improved environmental quality. This includes the use of green technologies that support LEED certification. Technologies which have potential to support multiple centers or programs are highly desirable. The following listing includes some specific areas of interests for supporting SSC's energy conservation goals:

Innovative Energy Conservation Technologies

SSC is interested in innovative technologies for reducing energy consumption and improving building sustainability through the use of alternative energy sources including of geothermal, natural gas and solar. Those using renewable sources of energy are highly desired. The goal is to reduce overall energy consumption and the Center's carbon footprint. Energy conservation technologies must also be cost effective to implement and maintain. Concepts will be evaluated based on their potential efficiency, ease of implementation and maintenance, and flexibility of applications (including, but not limited to, HVAC, preheating hot water heaters, and other means of extracting energy), as well as, applicability to the Center's mission. Proposals will also be evaluated based on the maturity level to which the technology will be developed and innovative techniques. Expected TRL at end of Phase I is 2, and at the end of Phase II is 6.

Innovative Facility Sustainability Technologies

SSC is interested in innovative technologies for enhancing building and facility sustainability. The goal is to reduce the life-cycle costs for sustainability facilities and testing through the use of green or renewable products. Specific areas of interest include technologies which help sustain a healthy workplace including mold spore filtration, self-decontamination and air purification. Concepts will be evaluated on the innovativeness, maturity level of the technology and long-term viability of the concept. Expected TRL at end of Phase I is 2, and at the end of Phase II is 6.

Innovative Lighting Technology

Stennis Space Center is interested in developing innovative technologies, systems, or methodologies that will reduce the energy consumption and heat generation from facility lighting while maintaining the desired level of

illumination for safety and effective work environments. SSC is interested in innovative lighting technologies for the test areas, office areas and parking lots. Innovative approaches for bringing natural lighting through skylights or other receptors are also of interest. These lighting technologies will need to reduce energy consumption while maintaining a comfortable and safe working environment. Technologies can be for replacement a technology or optimization of current facility lighting system. SSC is particularly interested in replacing costly lighting in the test area (test stands, hydrogen/oxygen environments, hazardous and potentially corrosive environments). The lighting should be in compliance with IESNA RP 7-01, Practice for Industrial Lighting. Proposals will be evaluated based on the maturity level to which the technology will be developed and innovative techniques that will provide a reasonable life expectancy. Proposals will also be evaluated on implementation strategy and ease of maintenance. Expected TRL at end of Phase I is 2, and at the end of Phase II is 6.

Innovative Solar Technology

Reduction in energy consumption and subsequent energy cost is a high priority at SSC. SSC is interested in developing new technologies for the efficient and effective use of photovoltaic/solar cell to reduce energy costs. Major issues in the development and use of solar panel include efficient system design and installation as well as effective maintenance. Innovative approaches and tools to facilitate the design of efficient solar cell systems, effective application of solar cells systems for building rooftops or a separate field area of solar cells are desired as well as innovative approaches to the monitor the health of the system and maintenance methods to insure the most effective and efficient operations of the system in an environment with high humidity, extensive rain showers, high pollen counts, rapid mold and fungal growth, etc. Expected TRL at end of Phase I is 2, and at the end of Phase II is 6.